

REMARKS

Reconsideration of the present application is requested on the basis of the following particulars:

1. In the Specification

The specification has been amended to correct a typographical error that was identified during the course of review. In addition, the specification has been amended to reflect the amendment to claim 13 and was amended in accordance with the illustration of FIG. 36. Applicant submits that no new matter has been added as a result of this amendment. Acceptance of the amendment to the specification is respectfully requested.

2. Rejection of Claims 13, 15 and 19 under 35 U.S.C. 112, 2nd paragraph

Claims 13, 15 and 19 currently stand rejected under 35 U.S.C. 112, 2nd paragraph for being indefinite. Applicant has amended claims 13, 15 and 16, and as a result, respectfully submits that the claims as-amended are sufficiently clear to overcome the rejection. Specifically, claim 13 has been amended to recite at least one "passageway" as opposed to a groove, and the limitation "as such" has been removed. Claim 15 has been amended by providing antecedent basis for "housing." Finally, claim 19 has been amended so that it is now dependent from claim 17 as opposed to claim 18, thereby removing any confusion.

In view of these amended claims, Applicant respectfully submits that claims 13, 15 and 19 comply with 35 U.S.C. 112, 2nd paragraph. Accordingly, withdrawal of the rejection is requested.

3. In the Drawings

FIGS. 35 and 36 have been amended to denote the "passageway" as recited in claim 13. The passageway is denoted by reference numeral --20--. Acceptance of the amendment to the drawings is respectfully requested.

4. Amendment to the Claims and New Claim 21

Besides the aforementioned amendment to the claims, claim 1 has been amended to include the feature that the piezoceramic disk has two radial surfaces, and one of the radial surfaces of the piezoceramic disk is directly attached to the membrane. Support for this amendment is found on page 7, lines 25-31, and is shown in FIGS. 22, 33, 36, 38 and 44. The amendment to claims 16 and 18 correct typographical errors in the claims as originally filed. New claim 21 recites an additional aspect of the transducer of the present invention and the subject matter recited therein is supported in the specification of the present application on page 18, lines 29-34.

5. Rejection of claims 1-11, 13-18 and 20 under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,332,029 (Azima et al. '029) or in the alternative U.S. Patent 6,377,695 (Azima et al. '695)

Claims 1-11, 13-18 and 20 stand rejected as being anticipated by Azima et al. '029, or in the alternative, Azima et al. '695. In view of the amendment to claim 1, Applicant respectfully traverses these rejections. Specifically, Azima et al. '029 and Azima et al. '695 each fail to disclose or suggest a transducer comprising a one-piece or multi-piece piezoceramic disk having two radial surfaces and a membrane formed of a material which attenuates sound vibrations, wherein one of the radial surfaces of the piezoceramic disk is directly attached to the membrane. Claims 2-11, 13-18 and 20, which depend directly or indirectly on claim 1, are thus patentable in view of their dependency from claim 1 and their individually recited elements.

Turning to Azima et al. '029, this reference discloses an acoustic device that operates significantly different than the transducer of the present invention. More particularly, this acoustic device is a "distributed mode" type device in that it generates sound by distributing and bending waves. Of further note, this device excites waves over a significant area and has a diffuse non-directional output. It will be noted that Azima et al. '695 incorporates the teachings of Azima et al. '029 (col. 5, lines 59-65 - in referring to U.S. patent application 08/707,012) and teaches nothing more than installing the acoustic devices of Azima et al. '029 in a specific trim panel as taught by Azima et al '695.

Contrary to the acoustic device of Azima et al. '029 and '695, the transducer of the present application is a piezoceramic speaker that is near pistonic and the local area is of the excited type with point source coherent radiation characteristics. The type of speaker disclosed in the present invention is of the type that Azima et al. '695 refers to in distinguishing the acoustic device of Azima et al. '029 over known types of speakers (col. 2, lines 50-55).

In observing FIG. 13 of Azima et al. '029, it is readily apparent that the construction of the acoustic device of Azima et al. '029 is significantly different from the transducer of amended claim 1 of the present invention. Particularly, FIG. 13 shows a piezo-electric bender 27 that is mounted on a cylindrical block 93 that is connected to a sound radiating panel 2. The cylindrical block 93 is described as being of rigid foam plastic that is fixed in an aperture 20 of the panel 2. In this embodiment, the bender 27 is described as being freely suspended adjacent to a face of the face (col. 32, lines 44-52). Obviously, the piezo-electric bender is not directly attached to the panel.

Turning to FIG. 14, Azima et al. '029 shows another embodiment of the acoustic device described therein. In this embodiment, the piezo bender 27 is mounted along its periphery to the panel 2 such that the piezo bender is freely suspended over a cavity of the panel wherein only the periphery of the bender is in

contact with the panel. Alternatively, FIGS. 24 and 47 show different embodiments of the acoustic device of Azima et al. '029, wherein the piezo bender attached onto a larger metal disk 118 which in turn is attached to the panel 2.

Nowhere in this reference is there any disclosure or suggestion of attaching an entire radial surface of a piezoceramic disk to a membrane, as recited in claim 1 of the present invention.

As discussed previously, Azima et al. '695 does not disclose an acoustic device different than the device described in Azima et al. '029. In the Office Action it was noted that the radiator 5 is connected to a membrane 1, and thus Azima et al. '695 discloses the present invention. Applicant respectfully disagrees with this interpretation of Azima et al. '695.

First, it will be pointed out that the membrane referred to in the Office Action is actually the roof lining 1 and the radiators 5 are located in the roof lining 1 (col. 5, lines 56-65). Thus, the comparison of the roof lining 1 and the exciter 5 of Azima et al. '695 in the Office Action cannot be construed as the piezoceramic disk and the membrane of the present invention, and is therefore erroneous. Next, while Azima et al. '695 may disclose a transducer 6 that is mounted on the radiator 5, the transducer 6 is described as being arranged to launch bending waves into the radiator to cause it to resonate to produce an acoustic output (col. 5, lines 61 through col. 6, lines 5). Nowhere in Azima et al. '695 is there any specific teaching that describes the specific construction of the transducer described therein, and thus there is no disclosure or suggestion that recites the transducer of the present invention recited in claim 1. Lastly, Azima et al. '695 repeats throughout its detailed description that the radiator operates as described in Azima et al. '029 (col. 6, lines 4-5 and 26-27), and as discussed above, Azima et al. '029 fails to disclose the transducer of the present invention.

In view of the above-observations, Applicant respectfully submits that neither Azima et al. '029 and Azima et al. '695 disclose, suggest or teach the transducer

recited in claim 1 of the present invention. Thus, claim 1 is patentable. Claims 2-11, 13-18 and 20, which depend from claim 1, are thus patentable based on their dependency from claim 1 and their individually recited elements. Withdrawal of this rejection is therefore requested.

6. Rejection of claims 12 and 17-18 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,332,029 (Azima et al. '029) or in the alternative U.S. Patent 6,377,695 (Azima et al. '695)

As indicated above, Applicant submits that Azima et al. '029 and Azima et al. '695 fail to disclose, suggest or teach the transducer of claim 1. Claims 12 and 17-18, which depend indirectly from claim 1, are at least patentable based on their dependency from claim 1 and their individually recited elements. Withdrawal of the rejection is respectfully requested.

7. Conclusion

In view of the amendment to the claims, new claim 21, and further in view of the foregoing remarks, it is respectfully submitted that the application is in condition for allowance. Accordingly, it is respectfully requested that claims 1-21 be allowed and the application be passed to issue.

Application No.: 09/901,635
Examiner: Suhan NI
Art Unit: 2643

If any issues remain that may be resolved by a telephone or facsimile communication with the Applicant's Attorney, the Examiner is invited to contact the undersigned at the numbers shown below.

BACON & THOMAS, PLLC
625 Slaters Lane, Fourth Floor
Alexandria, Virginia 22314-1176
Phone: (703) 683-0500

Date: August 26, 2003

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Respectfully submitted,

A handwritten signature in black ink, appearing to read "Justin J. Cassell", written in a cursive style.

JUSTIN J. CASSELL
Attorney for Applicant
Registration No. 46,205



REPLACEMENT SHEET

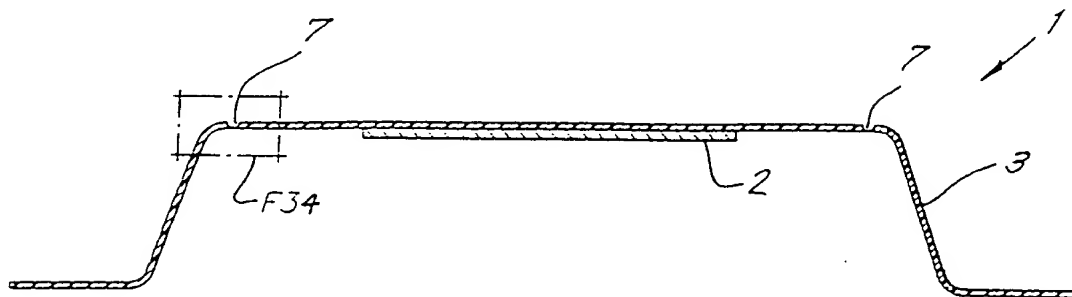


Fig. 33

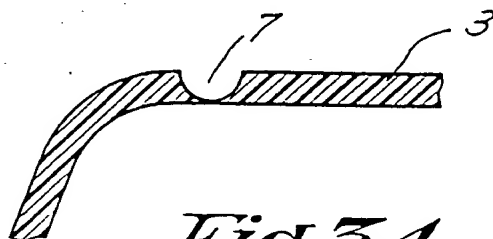


Fig. 34

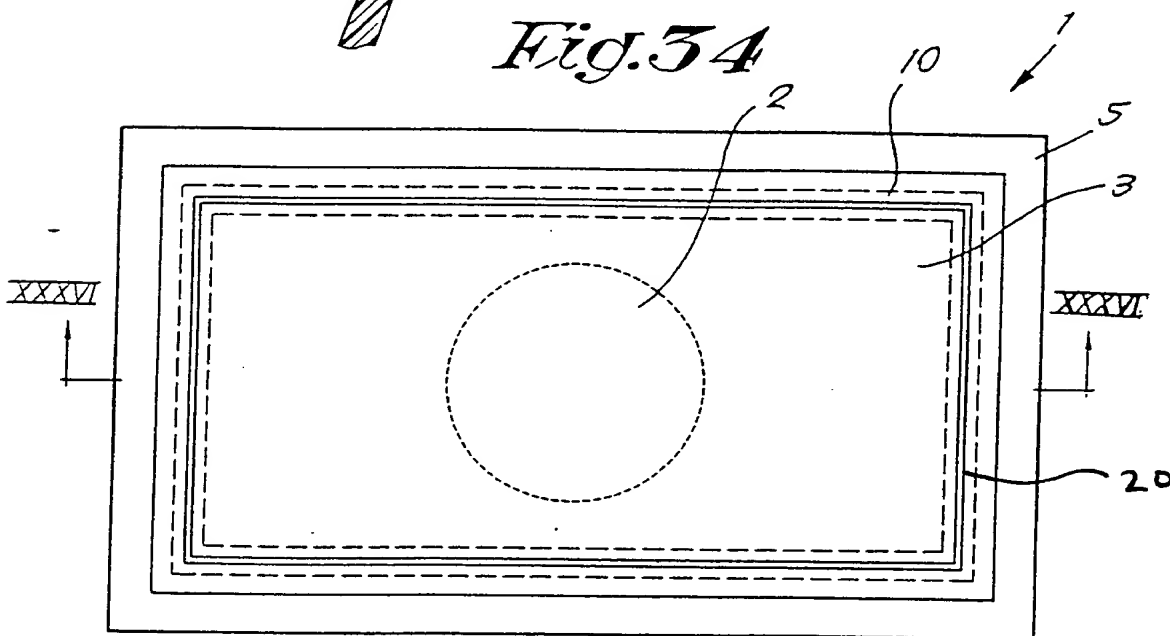


Fig. 35

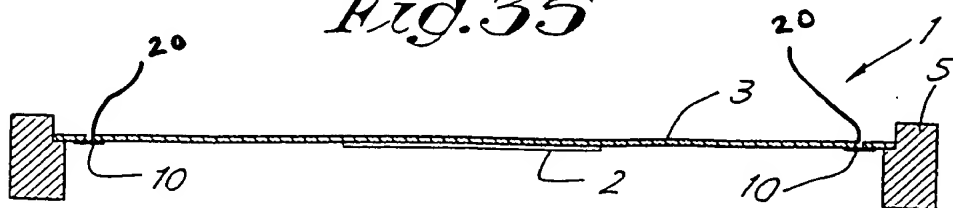


Fig. 36